

**UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK**

CARNEGIE INSTITUTION OF WASHINGTON,

M7D CORPORATION,

*Plaintiffs,*

v.

PURE GROWN DIAMONDS, INC.,

IIA TECHNOLOGIES PTE. LTD D/B/A

IIA TECHNOLOGIES,

*Defendants.*

Civil Action No. \_\_\_\_\_

**COMPLAINT**

Plaintiffs Carnegie Institution of Washington and M7D Corporation (collectively, “Plaintiffs”) bring this action for patent infringement of U.S. Patent No. 6,858,078 and U.S. Patent No. RE41,189 (the “patents-in-suit”) against Defendants Pure Grown Diamonds, Inc. and Iia Technologies Pte. Ltd. d/b/a Iia Technologies (collectively, “Defendants”).

**THE PARTIES**

**Plaintiffs—Carnegie Institution of Washington and M7D Corporation**

1. Plaintiff Carnegie Institution of Washington (“Carnegie”) is a Washington, D.C., corporation with its headquarters and principal place of business at 1530 P St. NW, Washington, DC 20005.

2. Carnegie is the assignee of the patents-in-suit.

3. Plaintiff M7D Corporation (“M7D”) is a Delaware corporation with its headquarters and principal place of business at 6700 Virginia Manor Road, Beltsville, Maryland 20705.

4. Carnegie and M7D are pioneers in the laboratory synthesis of high-clarity diamonds. Carnegie invented and patented technology using a chemical vapor deposition (“CVD”) process, specifically a microwave-plasma CVD (MPCVD) process, to control diamond growth from a diamond seed, atom by atom, to the highest purity and quality.



5. Carnegie also invented and patented an annealing process that improved the color of laboratory grown diamonds by removing the brown color caused by certain forms of trapped nitrogen.

6. M7D is the licensee of the patents-in-suit with all rights to enforce the patents.

7. In 2017, M7D, then-named Washington Diamonds LP, successfully grew the largest known CVD diamond as well as the largest known round CVD diamond.

**Defendant—Pure Grown Diamonds, Inc.**

8. Defendant Pure Grown Diamonds, Inc. (“PGD”) is a Delaware corporation with its principal place of business at 517 Route 1 South, Suite 1000, Iselin, New Jersey 08830-3023.

9. Upon information and belief, on or about June 18, 2018, PGD moved to a new location in the New York City Diamond District located at 45 West 45th Street, 5th Floor, New York, New York 10036, with New York City phone number 646-992-3250.<sup>1</sup>

10. Upon information and belief, PGD also has a location at 28 West 44th St., Suite 1204, New York, NY 10036.<sup>2</sup>

11. Upon information and belief, PGD is headquartered in New York, New York.<sup>3</sup>

12. Upon information and belief, PGD has a principal place of business at one or more locations in New York City (the “PGD NYC Location”).

13. Upon information and belief, PGD owns or leases the PGD NYC Location.

14. PGD has an active registration to do business in New York with the Department of State. PGD lists its New York State Department of State process address as “C/O Business Filings Incorporated, 187 Wolf Road Suite 101, Albany, New York, 12205.”<sup>4</sup>

15. Upon information and belief, PGD has numerous employees in the United States and the New York State, including at the PGD NYC Location and in this Judicial District.

16. Upon information and belief, PGD actively solicits employees to work in New York State, including at the PGD NYC Location and in this Judicial District.

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<sup>1</sup> [https://www.linkedin.com/posts/puregrowndiamonds\\_pure-grown-diamonds-moves-to-new-york-city-activity-6414469877846863872-hKdj](https://www.linkedin.com/posts/puregrowndiamonds_pure-grown-diamonds-moves-to-new-york-city-activity-6414469877846863872-hKdj)

<sup>2</sup> <https://www.linkedin.com/company/pure-grown-diamonds/about/>

<sup>3</sup> <https://www.linkedin.com/company/pure-grown-diamonds/about/>

<sup>4</sup> Available via New York Department of State website, [https://appext20.dos.ny.gov/corp\\_public/CORPSEARCH.ENTITY\\_SEARCH\\_ENTRY](https://appext20.dos.ny.gov/corp_public/CORPSEARCH.ENTITY_SEARCH_ENTRY).

17. Upon information and belief, at least six employees currently reside in the New York City area and in this Judicial District.<sup>5,6</sup>

18. Upon information and belief, PGD conducts business—including the manufacture, use, offer for sale, sale, and/or importation of diamonds manufactured by a CVD process and/or annealed diamonds—from the PGD NYC Location.

19. Upon information and belief, PGD buys, makes, has made, offers for sale, sells, and/or uses CVD diamonds.

20. Upon information and belief, PGD buys, makes, has made, offers for sale, sells, and/or uses annealed diamonds.

21. Upon information and belief, PGD uses CVD diamonds and/or annealed diamonds to create jewelry such as bridal jewelry. For example, PGD released a “bridal collection” in late 2017 using their Type IIa diamonds “across 300 retail stores in the United States.”<sup>7</sup>

22. Upon information and belief, PGD offers for sale and sells CVD diamonds and/or annealed diamonds to customers, third-party diamond sellers, retailers, and other entities.<sup>8</sup>

23. Upon information and belief, PGD operates as a major chain with, among other things, loose CVD diamonds and/or annealed diamonds, and bridal jewelry that incorporates these diamonds.<sup>9</sup>

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<sup>5</sup> <https://www.linkedin.com/company/puregrowndiamonds/people/>

<sup>6</sup> <https://www.linkedin.com/company/pure-grown-diamonds/people/>

<sup>7</sup> PGD Press Release, “Pure Grown Diamonds Launches First-Ever Bridal Jewelry Collection,” Nov. 29, 2017, <https://www.prnewswire.com/news-releases/pure-grown-diamonds-launches-first-ever-bridal-jewelry-collection-300563786.html>.

<sup>8</sup> <https://puregrowndiamonds.com/become-a-retailer/>

<sup>9</sup> *Id.*

24. Upon information and belief, PGD operates as an independent store to customers wishing to purchase CVD diamonds and/or annealed diamonds, including without limitation through the PGD website, the PGD NYC Location, and PGD's NYC "showroom."<sup>10,11</sup>

25. Upon information and belief, PGD partners with retailers of PGD's CVD diamonds and/or annealed diamonds on digital campaigns.<sup>12</sup>

26. Upon information and belief, PGD offers branding, collateral support, and onsite and online training to actual and prospective retailers of PGD's CVD diamonds and/or annealed diamonds.<sup>13</sup>

27. Upon information and belief, PGD's CVD diamonds and/or annealed diamonds are sold by and/or used in jewelry sold by Brian Michael's Jewelers based in Tonawanda, NY.<sup>14</sup>

28. Upon information and belief, PGD's CVD diamonds and/or annealed diamonds are available through New York-based retailers such as Diamonds By Israel Standard / Pure Grown Showroom.<sup>15</sup> Upon further information and belief, PGD's CVD diamonds and/or annealed diamonds are also sold by and/or used in jewelry sold by numerous other jewelry retailers.<sup>16</sup>

29. Upon information and belief, PGD has knowledge of each of the patents-in-suit, including the subject matter and claims of the patents-in-suit. The existence of the patents-in-suit are well known in the lab-grown diamond industry, and in particular are well known by lab-grown diamond manufacturers, importers, and sellers, such as PGD.

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<sup>10</sup> *Id.*

<sup>11</sup> PGD press release, "World's Largest Pure Grown Diamond Unveiled," PR Newswire (Dec. 8, 2014), <https://tiny.cc/0qs7gz>.

<sup>12</sup> <https://puregrowndiamonds.com/become-a-retailer/>

<sup>13</sup> *Id.*

<sup>14</sup> <https://www.brianmichaelsjewelers.com/page/pure-grown-diamonds.html>

<sup>15</sup> PGD press release, "World's Largest Pure Grown Diamond Unveiled," PR Newswire (Dec. 8, 2014), <https://tiny.cc/0qs7gz>.

<sup>16</sup> *Id.*

30. Upon information and belief, principals in PGD are aware of the existence of the patents-in-suit and that the manufacturing and annealing processes employed by PGD and/or its manufacturer(s) and distributor(s) fall within the scope of at least some of the claims in each of the patents-in-suit.

31. Upon information and belief, PGD, having knowledge of the patents-in-suit and knowledge that its respective CVD diamonds and/or annealed diamonds are made with processes that fall within the scope of at least some of the claims in the patents-in-suit, have, and are currently, manufacturing, importing, using, selling and/or offering for sale its CVD diamonds and annealed diamonds.

**Defendant—Ila Technologies PTE, Ltd.**

32. Upon information and belief, Ila Technologies PTE, Ltd. (“Ila Technologies”) grows/manufactures at least some of PGD’s CVD diamonds.

33. Upon information and belief, Ila Technologies anneals at least some of PGD’s diamonds.

34. Upon information and belief, Ila Technologies is PGD’s sister company.<sup>17</sup>

35. Upon information and belief, Ila Technologies is incorporated and located in Singapore.<sup>18</sup>

36. Upon information and belief, Ila Technologies has a headquarters at 17 Tukang Innovation Drive, Singapore 618300.<sup>19</sup>

37. Upon information and belief, at least some of PGD’s CVD diamonds are manufactured by Ila Technologies in Singapore.

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<sup>17</sup> *Id.*

<sup>18</sup> *Id.*

<sup>19</sup> <http://2atechnologies.com/contact-us/>

38. Upon information and belief, at least some of PGD's annealed diamonds are annealed by Ila Technologies in Singapore.

39. Upon information and belief, "Pure Grown Diamonds is the exclusive retailer and distributor of diamonds grown by Ila Technologies."<sup>20</sup>

40. Upon information and belief, Ila Technologies manufactures, uses, offers for sale, sells, and/or imports CVD diamonds and/or annealed rough diamonds, specialized diamonds, semi-finished diamonds, and finished diamonds, including through Ila Technologies' "technology and supply chain partners, which are also part of [its] Global Group."<sup>21</sup>

41. Upon information and belief, Ila Technologies offers to sell and sells CVD diamonds and/or annealed diamonds to PGD.

42. Upon information and belief, PGD imports at least some of its CVD diamonds and/or annealed diamonds from Ila Technologies.

43. Upon information and belief, each of PGD and Ila Technologies import CVD diamonds and/or annealed diamonds to locations in the United States, including to PGD's location(s) in New York State and PGD's NYC Location.

44. Upon information and belief, Ila Technologies has knowledge of each of the patents-in-suit, including the subject matter and claims of the patents-in-suit. The existence of the patents-in-suit are well known in the lab-grown diamond industry, and in particular are well known by lab-grown diamond manufacturers, importers, and sellers, such as Ila Technologies.

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<sup>20</sup> PGD press release, "World's Largest Pure Grown Diamond Unveiled," PR Newswire (Dec. 8, 2014), <https://tiny.cc/0qs7gz>.

<sup>21</sup> <http://2atechnologies.com/technology-value-chain/>

45. Upon information and belief, principals in Ila Technologies are aware of the existence of the patents-in-suit and that the manufacturing and annealing processes employed by Ila Technologies falls within the scope of at least some of the claims in each of the patents-in-suit.

46. Upon information and belief, Ila Technologies, having knowledge of the patents-in-suit and knowledge that its respective CVD diamonds and/or annealed diamonds are made with processes that fall within the scope of at least some of the claims in the patents-in-suit, have, and are currently, manufacturing, importing, using, selling and/or offering for sale its CVD diamonds and annealed diamonds.

### **JURISDICTION AND VENUE**

47. Plaintiffs incorporate and reallege paragraphs 1–46, above.

48. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. § 1 *et seq.* This Court has jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a)

49. Plaintiffs have standing to bring this patent infringement action as the assignee and licensee of the patents-in-suit with all rights to enforce the patents.

#### **Personal Jurisdiction over PGD**

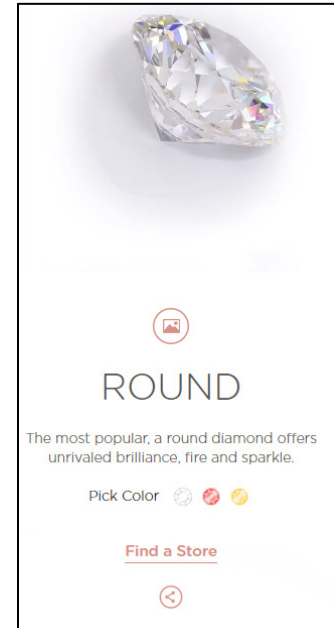
50. This Court has personal jurisdiction over PGD under the New York long-arm statute, N.Y.C.P.L.R. § 301, *et seq.* PGD, among other things, has transacted business in New York State, contracted to supply goods within New York State, committed acts of patent infringement in New York State, and owns, uses, or possesses real property within New York State.

51. New York has general personal jurisdiction over PGD at least because PGD “moved” to the PGD NYC Location, maintains a headquarters in New York City, operates out of



the PGD NYC Location (including making, using, offer for sale, selling, and/or importing CVD diamonds and/or annealed diamonds from/to the PGD NYC Location), leases or owns real property in New York City including at the PGD NYC Location, and employs workers at the PGD NYC Location. Furthermore, PGD maintains an address for service of process in Albany, New York.

52. New York also has general personal jurisdiction over PGD because of PGD's interactive website which targets prospective New York customers and provides the New York location's contact information only after a customer inputs their name and contact information. For example, PGD's website showcases to potential customers several diamond cuts (round, princess, emerald, oval, cushion, pear), with each offering a link for potential customers to "Find a Store."<sup>22</sup> PGD's website also offers to potential customers a "Store Locator" or



<sup>22</sup> <https://puregrowndiamonds.com/diamonds/>

“Find a Retailer” feature from which they can find and purchase PGD diamonds. Based on the provided map, at least one of these locations is in New York State.<sup>23</sup>

The screenshot shows the PGD website's 'Find a Retailer' page. At the top, there is a navigation bar with links: STORE - LOCATOR, EDUCATION, PURE MOMENTS, ABOUT, PGD (logo), DIAMONDS, BECOME A RETAILER, RETAILER LOGIN, and SEARCH. Below the navigation bar is a banner image of a couple smiling, with the text 'FIND A RETAILER' overlaid. Under the banner, there is a form with the instruction: 'Fill in the form to receive retailer's information, most suitable to your location.' The form contains three input fields: NAME, EMAIL ID, and ZIPCODE. Below these fields is a checkbox labeled 'I'm not a robot' and a CAPTCHA image. To the right of the CAPTCHA is a red 'Submit' button. Below the form is a map of the United States with red heart icons indicating PGD locations in various states, including New York.

Additionally, PGD’s website includes an interactive form under the “Become a Retailer” heading by which prospective retailers can “Get in touch” with PGD.<sup>24</sup>

53. This Court also has specific personal jurisdiction over PGD. Upon information and belief, PGD regularly conducts business and has committed acts of patent infringement in this Judicial District, New York State, and elsewhere in the United States. New York has specific personal jurisdiction over PGD at least because PGD makes, uses, offers to sell, sells, and/or imports infringing diamonds from the PGD NYC Location and/or other New York State location(s).

54. Upon information and belief, PGD’s promotional materials, advertisements, and other information encourage others, such as third-party diamond retailers and jewelry stores, to

<sup>23</sup> <https://puregrowndiamonds.com/store-locator/>

<sup>24</sup> <https://puregrowndiamonds.com/become-a-retailer/>

use, offer to sell, and sell the infringing diamond products. Upon information and belief, PGD's promotional materials, advertisements, and other information target third-party diamond retailers, jewelry stores, and other entities in New York State and this Judicial District.

55. Upon information and belief, PGD, directly or indirectly, participates in the stream of commerce that results in products, including the infringing CVD diamonds and/or annealed diamonds, being made, used, offered for sale, and/or sold in New York State and/or imported into the United States to New York State, including through PGD's regular and established places of business and/or authorized dealers and sales agents in New York State and this Judicial District. Upon information and belief, PGD derives revenues from its infringing acts occurring within New York State and in this Judicial District.

56. Upon information and belief, PGD has also induced acts of patent infringement by others, and/or has contributed to patent infringement by others in this Judicial District, New York State, and elsewhere in the United States. For example, upon information and belief, PGD offers for sale and sells its infringing CVD diamonds and/or annealed diamonds to New York State third-parties such as retailers for their own infringing use, offer for sale, or sale of PGD's CVD diamonds and/or annealed diamonds to other third-parties such as customers, with knowledge of the patents-in-suit and that PGD's lab-grown diamonds infringe at least some of the claims of the patents-in-suit. Upon further information and belief, PGD actively solicits purchases and sales from such New York State retailers and partners with such retailers in advertisements, and does so with the knowledge of Plaintiffs' patents.

57. New York's exercise of personal jurisdiction over PGD is reasonable and consistent with due process at least because PGD has, upon information and belief, purposely conducted ongoing and continuous business activities in New York State; has purposely moved its operations

from New Jersey to New York; maintains a business headquarters in New York; owns or leases real property in New York State; employs workers in New York State; manufactures and/or uses CVD diamonds and/or annealed diamonds in New York State; sells and offers for sale CVD diamonds and/or annealed diamonds to customers located or domiciled in New York State; sells and offers to sell CVD diamonds and/or annealed diamonds to retailers located in New York State; targets retailers in New York State and provides them with marketing and other support; and imports CVD diamonds and/or annealed diamonds into New York State.

**Personal Jurisdiction over Ila Technologies**

58. This Court has personal jurisdiction over Ila Technologies under at least the federal long-arm statute, Rule 4(k)(2) of the Federal Rules of Civil Procedure, at least because this action arises under federal patent law; Ila Technologies has made or used CVD diamonds and/or annealed diamonds; Ila Technologies has offered for sale or sold CVD diamonds and/or annealed diamonds to United States customers; Ila Technologies has offered to sell or sold its CVD diamonds and/or annealed diamonds to PGD; Ila Technologies' acts of infringement have caused tortious injury to Plaintiffs headquartered, incorporated, and operating in the United States; and the exercise of personal jurisdiction over Ila Technologies would be reasonable, fair, and comport with due process.

59. Upon information and belief, Ila Technologies has also induced acts of patent infringement by others, and/or has contributed to patent infringement by others in the United States. For example, upon information and belief, Ila Technologies has manufactured and used CVD diamonds and/or annealed diamonds, and has offered for sale and sold its CVD diamonds and/or annealed diamonds to United States and foreign third-parties such as retailers for their own

infringing United States use, offer for sale, sale, or importation, with knowledge of the patents-in-suit and that its lab-grown diamonds infringe at least some of the claims of the patents-in-suit.

60. Upon further information and belief, Ila Technologies actively solicits purchases and sales from United States customers, including specifically PGD. For example, Dr. Devi Shanker Misra is CTO of both PGD and Ila Technologies.<sup>25,26</sup> Ila Technologies states that its gemstone diamonds are available through its “partners,”<sup>27</sup> and a PGD press release states that PGD is the “exclusive retailer and distributor of diamonds grown by Ila Technologies.”<sup>28</sup>

### **Venue over PGD**

61. Patent venue over PGD is proper in this judicial district under 28 U.S.C. § 1400(b) because PGD resides at the PGD NYC Location and therefore resides in the Southern District of New York.

62. Patent venue over PGD is also proper in this judicial district under 28 U.S.C. § 1400(b) because the PGD NYC Location is a regular and established place of business and PGD has committed acts of patent infringement including, upon information and belief, selling, offering for sale, and/or importing infringing CVD diamonds from its PGD NYC Location, which is located in this Judicial District.

### **Venue over Ila Technologies**

63. Venue over Ila Technologies is proper in this judicial district under 28 U.S.C. § 1391(c)(3) because, upon information and belief, Ila Technologies is “not resident in the United States [and therefore] may be sued in any judicial district.”

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<sup>25</sup> PGD press release, “World’s Largest Pure Grown Diamond Unveiled,” PR Newswire (Dec. 8, 2014), <https://tiny.cc/0qs7gz>.

<sup>26</sup> <http://2atechnologies.com/history/>

<sup>27</sup> <http://2atechnologies.com/industrial-diamond-applications/>

<sup>28</sup> PGD press release, “World’s Largest Pure Grown Diamond Unveiled,” PR Newswire (Dec. 8, 2014), <https://tiny.cc/0qs7gz>.

### **THE PATENTS-IN-SUIT**

64. On February 22, 2005, the United States Patent Office duly and legally issued U.S. Patent No. 6,858,078 (“the ’078 Patent”), titled “Apparatus and Method of Diamond Production.” A true and correct copy of the ’078 Patent is attached as Exhibit A.

65. The ’078 Patent was issued based on Application No. 10/288,499, filed November 6, 2002.

66. The ’078 Patent was and is assigned to the Carnegie Institution of Washington.

67. M7D is the licensee of the ’078 Patent which possesses all rights to enforce the ’078 Patent.

68. The ’078 Patent teaches a method for producing MPCVD diamonds using a faster growth rate, moderate pressures within the deposition chamber, and with a particular temperature gradient to be maintained during diamond growth.

69. The ’078 Patent includes 64 claims. Independent claim 1 of the ’078 Patent recites a method for diamond production by controlling the diamond’s growth surface gradient temperature to within 20°C and growing a single-crystal diamond by MPCVD in a deposition chamber with an atmospheric pressure of at least 130 torr. Independent claim 12 similarly recites a method for diamond production, but with a growth temperature of 900–1400°C.

70. On April 6, 2010, the United States Patent Office duly and legally reissued U.S. Reissue Patent No. RE41,189 (“the ’189 Patent”), titled “Method of Making Enhanced CVD Diamond.” A true and correct copy of the ’189 Patent is attached as Exhibit B.

71. The ’189 Patent is a reissue of U.S. Patent No. 6,811,610, filed on June 3, 2002 as Application No. 10/161,266 and issued on November 2, 2004.

72. The ’189 Patent was and is assigned to the Carnegie Institution of Washington.

73. M7D is the licensee of the '189 Patent which possesses all rights to enforce the '189 Patent.

74. The '189 Patent teaches the benefits of a method for improving the optical properties of already-grown chemical vapor deposition (CVD) diamonds by heat treating single crystal CVD diamond at high temperature and pressure, resulting in increased clarity.

75. The '189 Patent includes 7 claims. Independent claim 1 of the '189 Patent recites a method to improve the optical clarity of a single crystal CVD diamond by raising it to a set temperature of at least 1500°C and at a certain pressure.

#### **BACKGROUND ON NATURAL AND LAB-GROWN DIAMONDS**

76. A diamond is a solid form of carbon with the carbon atoms arranged in a crystal structure called diamond cubic. When formed by the Earth, the process requires temperatures over 2,000 degrees Fahrenheit and pressure in excess of 725,000 pounds per square inch.

77. Diamonds may also be created under certain laboratory conditions. Unlike diamond substitutes such as cubic zirconia, “grown” or “synthetic” diamonds are crystalline forms of carbon. In fact, the Federal Trade Commission has recently changed the definition of the term “diamond” to remove the term “natural”, acknowledging that lab grown diamonds have the same physical, chemical and optical qualities as diamonds mined from the earth.<sup>29</sup>

78. One method to produce lab-grown diamonds is chemical vapor deposition (CVD). CVD starts with a diamond seed. A mixture of hydrocarbon gases is fed into a chamber under low pressure and energized under conditions for diamond growth. The CVD process is used to control the diamond growth and achieve a high purity.

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<sup>29</sup> <https://www.ftc.gov/public-statements/2018/07/statement-basis-purpose-final-revisions-jewelry-guides>, see page 114.

79. Multiple techniques exist within CVD. Microwave-plasma CVD (MPCVD) can create high-quality diamond growth by, among other things, limiting the defects that become incorporated.

80. CVD diamonds, like all diamonds, are sorted into either Type I (with nitrogen as the main impurity) and Type II (with minimal nitrogen impurities). Within Type II, diamonds are further sorted into Type IIa and Type IIb. Type IIa have trace nitrogen impurities, but imperfections can impart color (yellow, brown, orange, pink, red, or purple) to the gem. CVD diamonds are typically Type IIa.

#### **PGD'S CVD DIAMOND PRODUCTS**

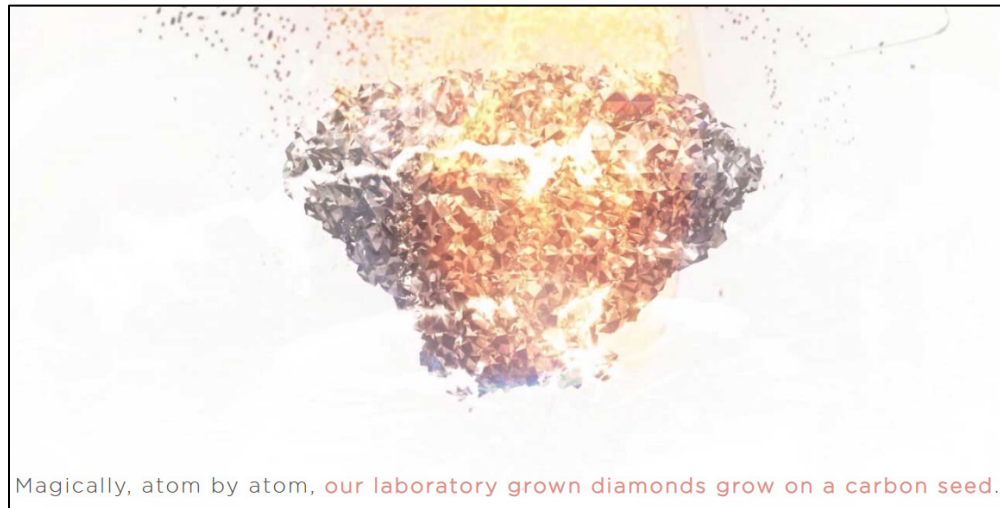
81. Upon information and belief, PGD, either directly or through intermediaries, makes, uses, offers to sell, and/or sells in the United States, and/or imports into the United States, lab-grown CVD diamonds and/or annealed diamonds. The alleged inventor of PGD's diamond-growing method describes PGD's diamonds as grown from a "process that cultivates incredible diamonds in a Microwave Plasma Chemical Vapor Deposition chamber from a small carbon seed."<sup>30</sup>

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<sup>30</sup> PGD press release, "World's Largest Pure Grown Diamond Unveiled," PR Newswire (Dec. 8, 2014), <https://tiny.cc/0qs7gz>.



82. PGD's website describes its process as lab-growing diamonds on a "carbon seed."<sup>31</sup>



83. PGD also describes its diamond-growth process as: "A diamond seed is placed inside a low-pressure microwave chamber. Hydrogen and methane gases are introduced. A microwave generator pumps energy into the chamber that ignites a glowing plasma ball. Carbon molecules rain on the seed. Crystallization begins. The process is completed within 42 to 70 days."<sup>32</sup>

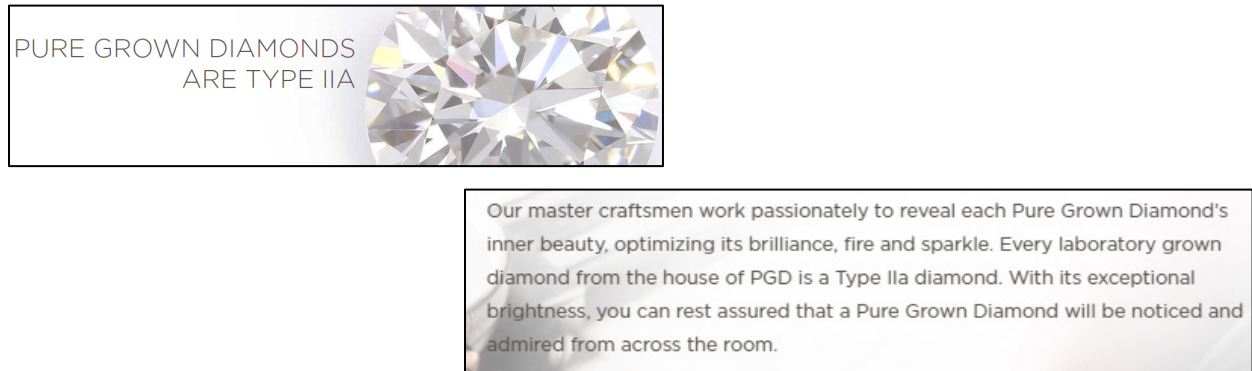
84. A PGD press release further described PGD's laboratory-growing process as using a diamond seed inside a low-pressure microwave chamber, adding hydrogen and methane gases, using a microwave generator to pump energy into the system and ignite a glowing plasma ball creating carbon molecules that rain down on the diamond seed, and a 42 to 70-day crystallization process.

A diamond seed is placed inside a low-pressure microwave chamber. Hydrogen and methane gases are introduced. A microwave generator pumps energy into the chamber that ignites a glowing plasma ball. Carbon molecules rain on the seed. Crystallization begins. The process is completed within 42 to 70 days.

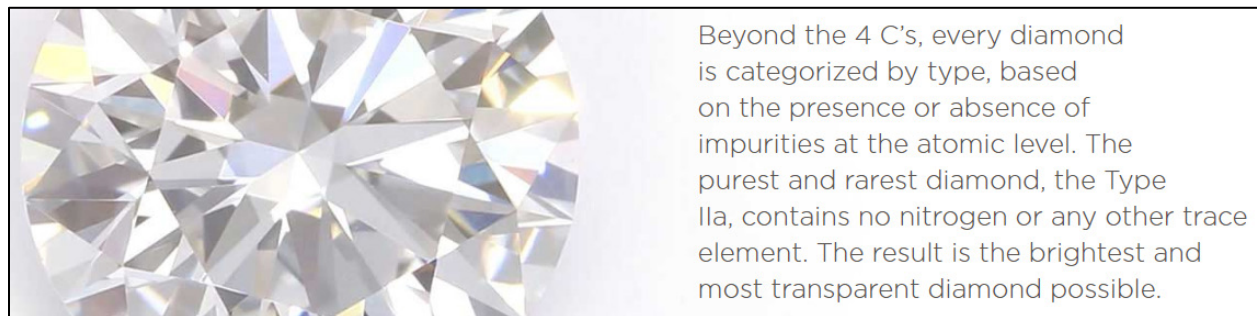
<sup>31</sup> <https://puregrowndiamonds.com/#>

<sup>32</sup> PGD press release, "World's Largest Pure Grown Diamond Unveiled," PR Newswire (Dec. 8, 2014), <https://tiny.cc/0qs7gz>.

85. Upon information and belief, PGD markets its infringing CVD diamonds as Type IIa.<sup>33,34</sup>



86. According to PGD, Type IIa diamonds “contain[] no nitrogen or any other trace element . . . result[ing in] the brightest and most transparent diamond possible.”<sup>35</sup>



## **IIA TECHNOLOGIES' DIAMOND PRODUCTS**

87. Upon information and belief, Iia Technologies, either directly or through intermediaries, makes, uses, offers to sell, and/or sells in the United States, and/or imports into the United States, lab-grown CVD diamonds and/or annealed diamonds.

<sup>33</sup> <https://puregrowndiamonds.com/>

<sup>34</sup> <https://puregrowndiamonds.com/about/>

<sup>35</sup> <https://puregrowndiamonds.com/>

88. Ila Technologies describes its diamond-growing process as using microwave plasma chemical vapor deposition (MPCVD), which Ila Technologies claimed was an improvement over prior CVD and HPHT methods.<sup>36,37,38</sup>

#### Technology Overview

There were two available production methods to grow diamonds; Chemical Vapour Deposition (CVD) and High Pressure High Temperature (HPHT). The HPHT method could grow large size diamonds at relatively commercial yields with commonly available technology. The problem was that this technology could not grow what the world wanted, colourless high purity Type Ila single crystal diamonds. This is due to a catalyst used in the HPHT method that stabilizes the growth process but also causes a brown-orange colouration that was not desirable in the Jewellery world.

As such, the technology chosen by the team from the beginning of its operations was a type of CVD process called Microwave Plasma Chemical Vapour Deposition (MPCVD). This technology, although simpler in form, is much more complicated and expensive than HPHT. The technology works at lower pressures exposing multiple diamond seeds to a carbon-rich environment. At the optimised conditions, carbon starts depositing, the seed starts accepting the available carbon, and the natural process of crystallisation starts.

Ila Technologies is unparalleled in its quantity and quality of CVD diamonds and its ability to work with customers to customise their product for specific applications.

#### Technology Value Chain

Ila Technologies Pte. Ltd. adopted the CVD technology for diamond growth. Although HPHT was a proven technology, it had its limitations. Ila Technologies was focused on creating pure diamonds which are colourless and hence the technology adopted was Microwave Plasma Chemical Vapour Deposition or MPCVD.

Ila Technologies' Singapore facility powers a technology called Microwave Plasma Chemical Vapour Deposition (MPVCD) which is able to provide an environment suitable for growth while relying on nature to do the rest. Rough diamonds grown by Ila Technologies are used in the commercial sector (mechanical, manufacturing, aerospace industries), scientific and medical instrumentation as well as in the luxury sector.

Ila Technologies recognized that older techniques “could not grow what the world wanted, colourless high purity Type Ila single crystal diamonds,” because “a catalyst used in the HPHT method that stabilizes the growth process . . . also causes a brown-orange colouration [sic] that was not desirable in the Jewellery [sic] world.”<sup>39</sup>

89. Ila Technologies describes its MPCVD process as “work[ing] at lower pressures” and exposing “diamond multiple seeds” in an environment conducive to crystallization.<sup>40</sup>

<sup>36</sup> <http://2atechnologies.com/technology-overview/>

<sup>37</sup> <http://2atechnologies.com/technology-value-chain/>

<sup>38</sup> <http://2atechnologies.com/history/>

<sup>39</sup> <http://2atechnologies.com/technology-overview/>

<sup>40</sup> <http://2atechnologies.com/technology-value-chain/>

90. Upon information and belief, Ila Technologies’ method results in “gem-quality diamonds that are pure Type IIa diamonds.”<sup>41</sup>

Ila Technologies, is the largest MPCVD facility in the world and is growing gem-quality diamonds that are pure Type IIa diamonds. Ila Technologies is unparalleled in the quantity and quality of CVD diamonds that it can grow and its ability to work with customers to customise products for specific applications.

91. Upon information and belief, Ila Technologies manufactures, uses, markets, offers for sell, sells, and/or imports its Type IIa diamonds for a variety of purposes, including for example gems/jewelry, the electro-chemical industry, optical devices, telecommunication, electronics, precision mechanical devices, and heat spreaders and other thermal applications.<sup>42,43</sup>

#### **COUNT ONE: INFRINGEMENT OF THE '078 PATENT**

92. Plaintiffs incorporates and reallege paragraphs 1–91, above.

93. Plaintiffs have not licensed or otherwise authorized PGD or Ila Technologies to make, use, offer for sale, or sell within the United States, or import into the United States, any product(s) that embody the inventions of the '078 Patent.

#### **Direct Infringement**

94. Each Defendant has directly infringed and continues to directly infringe one or more claims of the '078 Patent, including at least independent claims 1 and 12, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, and/or selling within the United States, or importing into the United States, products that satisfy each and every limitation of one or more claims of the '078 Patent (the “infringing CVD diamonds” and/or the “infringing CVD diamond products”).

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<sup>41</sup> *Id.*

<sup>42</sup> <http://2atechnologies.com/history/>

<sup>43</sup> <http://2atechnologies.com/industrial-diamond-applications/>

95. PGD's website states that PGD's infringing CVD diamonds are grown using a diamond seed, as recited in claim 1 of the '078 patent (which requires microwave plasma chemical vapor deposition (MPCVD) on the growth surface of the diamond).<sup>44</sup>

96. A PGD press release states that PGD's infringing CVD diamonds are grown using an MPCVD process on a diamond/carbon seed, as recited in independent claims 1 and 12 of the '078 patent (which require microwave plasma chemical vapor deposition (MPCVD) on the growth surface of the diamond).<sup>45</sup>

97. Ila Technologies' website likewise states that its CVD diamonds are grown using an MPCVD process on a diamond seed, as recited in independent claims 1 and 12 of the '078 patent (which require microwave plasma chemical vapor deposition (MPCVD) on the growth surface of the diamond).<sup>46</sup>

98. Upon information and belief, each of PGD and Ila Technologies makes the infringing CVD diamonds by a process requiring maintaining the growth surface temperature gradient to within 20°C, as recited in independent claims 1 and 12 of the '078 Patent.

99. Upon information and belief, each of PGD and Ila Technologies makes the infringing CVD diamonds by a process requiring an atmospheric pressure of at least 130 torr, as recited in independent claim 1 of the '078 Patent.

100. Upon information and belief, each of PGD and Ila Technologies makes the infringing CVD diamonds by a process requiring temperatures of 900–1400°C, as recited in independent claim 12 of the '078 Patent.

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<sup>44</sup> <https://puregrowndiamonds.com/#>

<sup>45</sup> PGD press release, "World's Largest Pure Grown Diamond Unveiled," PR Newswire (Dec. 8, 2014), <https://tiny.cc/0qs7gz>.

<sup>46</sup> <http://2atechnologies.com/technology-value-chain/>

101. Upon information and belief, each of PGD and Ila Technologies uses the infringing CVD diamonds to create additional jewelry items. For example, PGD released a “bridal collection” in late 2017 using their Type Ila diamonds “across 300 retail stores in the United States.”<sup>47</sup>

102. Ila Technologies likewise states that its infringing CVD diamonds are available in jewelry through its partners.<sup>48</sup>

103. Upon information and belief, Ila Technologies’ infringing CVD diamonds are also used in including jewelry as well as electro-chemical, optical, electronics, mechanical, and thermal applications.<sup>49</sup>

104. Upon information and belief, PGD offers for sale and sells its infringing CVD diamonds. For example, PGD’s infringing CVD diamonds are available through New York-based retailers such as Diamonds By Israel Standard / Pure Grown Showroom and The Gem Lab, as well as through numerous other retailers.<sup>50</sup> Additionally, upon information and belief, PGD has offered for sale and sold infringing CVD diamonds directly to other third-party customers including through its website, [www.PureGrownDiamonds.com](http://www.PureGrownDiamonds.com), and through its New York City showroom.<sup>51</sup>

105. Upon information and belief, Ila Technologies offers for sale and sells its infringing CVD diamonds. For example, upon information and belief, Ila Technologies’ infringing CVD diamonds are offered for sale and sold to PGD as well as other entities.<sup>52</sup>

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<sup>47</sup> *Id.*

<sup>48</sup> <http://2atechnologies.com/industrial-diamond-applications/>

<sup>49</sup> *Id.*

<sup>50</sup> PGD press release, “World’s Largest Pure Grown Diamond Unveiled,” PR Newswire (Dec. 8, 2014), <https://tiny.cc/0qs7gz>.

<sup>51</sup> *Id.*

<sup>52</sup> <http://2atechnologies.com/industrial-diamond-applications/>

106. Upon information and belief, each of PGD and Ila Technologies imports into New York State and the United States infringing CVD diamonds for purposes of using, offering for sale, and selling the infringing CVD diamonds.

**Induced Infringement**

107. Each Defendant has indirectly infringed and continues to indirectly infringe one or more claims of the '078 Patent, including at least independent claims 1 and 12, by knowingly and intentionally inducing others, including prospective and actual customers and retailers to directly infringe, literally or under the doctrine of equivalents, by using, offering to sell, and/or selling within the United States, and/or importing into the United States, products made by the infringing method, specifically PGD's and/or Ila Technologies' infringing CVD diamonds.

108. Upon information and belief, each Defendant knowingly and intentionally induced infringement of one or more claims of the '078 Patent in violation of 35 U.S.C. § 271(b), including at least independent claims 1 and 12, by taking active steps, directly and/or through intermediaries, to encourage others, including customers and retailers, to use, offer to sell, and/or sell within the United States, and/or import into the United States, Defendants' infringing CVD diamond products.

109. Upon information and belief, each Defendant had the specific intent to cause third parties (such as retailers) to use, offer to sell, and/or sell Defendants' infringing CVD diamond products to others (such as customers) in an infringing manner. Defendants' steps include, among other things, making, using, offering for sale, selling, and importing Defendants' infringing CVD diamond products in/into the United States; marketing, offering for sale, and selling Defendants' diamond products to retailers in the United States; marketing, offering for sale, and selling Defendants' infringing CVD diamond products to customers and other end-users in the United States; directly and indirectly promoting retailers' and others' use, sale, and offers for sale of



Defendants' infringing CVD diamond products in the United States; and providing educational and marketing support to retailers in order to increase indirect uses, offers for sale, and sales of Defendants' infringing CVD diamond products.

110. Upon information and belief, each of PGD and Ila Technologies is performing these steps with actual knowledge of the '078 Patent and with knowledge that the induced acts constitute infringement, at least as of the date of the complaint filed against them in this action.

111. Upon information and belief, if PGD did not have actual knowledge of the '078 Patent, PGD's lack of knowledge of the '078 Patent was willful. Upon information and belief, Dr. Devi Shankar Misra, Ph.D., is PGD's Chief Technical Officer and "inventor of the patented Pure Grown Diamond process" using MPCVD.<sup>53</sup> Upon information and belief, Dr. Misra is a named inventor on at least seven patents relating to diamonds, the earliest of which was not filed until June 2009 (claiming priority to June 2008) (DK3045570T3). Upon information and belief, to have obtained patents, prior art searches of the technological field were first required. Upon information and belief, Dr. Misra and/or PGD did become aware, or should have become aware, of the '078 Patent.

112. Upon information and belief, if Ila Technologies did not have actual knowledge of the '078 Patent, Ila Technologies' lack of knowledge of the '078 Patent was willful. Upon information and belief, Dr. Devi Shankar Misra, Ph.D., is Ila Technologies' Chief Technical Officer<sup>54</sup>; he is also an "inventor of the patented Pure Grown Diamond process" using MPCVD.<sup>55</sup> Upon information and belief, Dr. Misra is a named inventor on at least seven patents relating to

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<sup>53</sup> PGD press release, "World's Largest Pure Grown Diamond Unveiled," PR Newswire (Dec. 8, 2014), <https://tiny.cc/0qs7gz>.

<sup>54</sup> <http://2atechnologies.com/history/>

<sup>55</sup> PGD press release, "World's Largest Pure Grown Diamond Unveiled," PR Newswire (Dec. 8, 2014), <https://tiny.cc/0qs7gz>.



diamonds, the earliest of which was not filed until June 2009 (claiming priority to June 2008) (DK3045570T3). Upon information and belief, to have obtained patents, prior art searches of the technological field were first required. Upon information and belief, Dr. Misra and/or Ila Technologies did become aware, or should have become aware, of the '078 Patent.

113. Upon information and belief, each Defendant is aware that the normal and customary use of Defendants' infringing CVD diamond products by Defendants' customers and retailers would infringe the '078 Patent.

114. Each Defendant's inducement is ongoing.

**Willful Infringement**

115. Upon information and belief, each of PGD and Ila Technologies has knowledge of the '078 Patent and knowledge that their CVD diamonds and/or annealed diamonds infringe at least one claim of the '078 Patent. Notwithstanding their knowledge (or willful blindness thereto), each of PGD and Ila Technologies continued to make, have made, import, use, offer for sale, and sell their infringing CVD diamonds and/or annealed diamonds in the United States.

116. Each Defendant has willfully infringed, and continues to willfully infringe, one or more claims of the '078 Patent.

117. As a direct and proximate cause of the direct, induced and willful infringement by Defendants, Plaintiffs have been and will continue to be irreparably harmed in their business and property rights unless Defendants are enjoined from their infringing activity in the United States.

**COUNT TWO: INFRINGEMENT OF THE '189 PATENT**

118. Plaintiffs incorporate and reallege paragraphs 1–117, above.

119. Plaintiffs have not licensed or otherwise authorized PGD or Ila Technologies to make, use, offer for sale, or sell within the United States, or import into the United States, any product(s) that embody the inventions of the '189 Patent.

**Direct Infringement**

120. Each Defendant has directly infringed and continues to directly infringe one or more claims of the '189 Patent, including at least independent claim, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offer to sell, and/or selling within the United States, or importing into the United States, the infringing CVD diamonds and/or the infringing CVD diamond products, each of which satisfies each and every limitation of one or more claims of the '189 Patent.

121. PGD's website states that PGD's infringing CVD diamonds are grown using a diamond seed<sup>56</sup>, as recited in claim 1 of the '189 patent (requiring a "single-crystal CVD diamond").

122. Ila Technologies' website likewise states that its CVD diamonds are grown using an MPCVD process on a diamond seed<sup>57</sup>, as recited in independent claim 1 of the '189 patent (requiring a "single-crystal CVD diamond").

123. PGD's website<sup>58,59</sup> and Ila Technologies' website<sup>60</sup> describe the infringing CVD diamonds as "Type Ila."

124. CVD diamonds, without additional processing, are unlikely to be Type Ila. Instead, the optical clarity of the CVD-grown diamond is improved by another method.

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<sup>56</sup> <https://puregrowndiamonds.com/#>

<sup>57</sup> <http://2atechnologies.com/technology-value-chain/>

<sup>58</sup> <https://puregrowndiamonds.com/>

<sup>59</sup> <https://puregrowndiamonds.com/about/>

<sup>60</sup> *Id.*

125. Upon information and belief, each of PGD and Ila Technologies manufactures Type Ila diamonds by a process requiring a set temperature of at least 1500°C, as recited in claim 1 of the '189 Patent.

126. Upon information and belief, each of PGD and Ila Technologies manufactures Type Ila diamonds by a process requiring a pressure as recited in claim 1 of the '189 Patent.

127. Upon information and belief, each of PGD and Ila Technologies uses infringing CVD diamonds to create additional jewelry items. For example, PGD released a “bridal collection” in late 2017 using their Type Ila diamonds “across 300 retail stores in the United States.”<sup>61</sup>

128. Ila Technologies likewise states that its infringing CVD diamonds are available in jewelry through its partners.<sup>62</sup> Upon information and belief, Ila Technologies’ infringing CVD diamonds are also used in including jewelry as well as electro-chemical, optical, electronics, mechanical, and thermal applications.<sup>63</sup>

129. Upon information and belief, each of PGD and Ila Technologies uses, offers for sale, and sells infringing CVD diamonds.

130. Upon information and belief, each of PGD and Ila Technologies imports into New York State and the United States infringing CVD diamonds for purposes of offering for sale, selling, and using the infringing CVD diamonds.

**Induced Infringement**

131. Each Defendant has indirectly infringed and continues to indirectly infringe one or more claims of the '189 Patent, including at least independent claim 1, by knowingly and

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<sup>61</sup> *Id.*

<sup>62</sup> <http://2atechnologies.com/industrial-diamond-applications/>

<sup>63</sup> *Id.*

intentionally inducing others, including prospective and actual customers and retailers to directly infringe, literally or under the doctrine of equivalents, by using, offering to sell, and/or selling within the United States, and/or importing into the United States, products made by the infringing method, specifically PGD's and/or Ila Technologies' infringing CVD diamonds.

132. Upon information and belief, each Defendant knowingly and intentionally induced infringement of one or more claims of the '189 Patent in violation of 35 U.S.C. § 271(b), including at least independent claim 1, by taking active steps, directly and/or through intermediaries, to encourage others, including customers and retailers, to use, offer to sell, and/or sell within the United States, and/or import into the United States, Defendants' infringing CVD diamond products.

133. Upon information and belief, each Defendant had the specific intent to cause third parties (such as retailers) to use, offer to sell, and/or sell Defendants' infringing CVD diamond products to others (such as customers) in an infringing manner. Defendants' steps include, among other things, making, using, offering for sale, selling, and importing Defendants' infringing CVD diamond products in/into the United States; marketing, offering for sale, and selling Defendants' diamond products to retailers in the United States; marketing, offering for sale, and selling Defendants' infringing CVD diamond products to customers and other end-users in the United States; directly and indirectly promoting retailers' and others' use, sale, and offers for sale of Defendants' infringing CVD diamond products in the United States; and providing educational and marketing support to retailers in order to increase indirect uses, offers for sale, and sales of Defendants' infringing CVD diamond products.

134. Upon information and belief, PGD and/or Ila Technologies is/are performing these steps with actual knowledge of the '189 Patent and with knowledge that the induced acts constitute infringement, at least as of the date of the complaint filed against them in this action.

135. Upon information and belief, if PGD did not have actual knowledge of the '189 Patent, PGD's lack of knowledge of the '189 Patent was willful. Upon information and belief, Dr. Devi Shankar Misra, Ph.D., is PGD's Chief Technical Officer and "inventor of the patented Pure Grown Diamond process" using MPCVD.<sup>64</sup> Upon information and belief, Dr. Misra is a named inventor on at least seven patents relating to diamonds, the earliest of which was not filed until June 2009 (claiming priority to June 2008) (DK3045570T3). Upon information and belief, to have obtained patents, prior art searches of the technological field were first required. Upon information and belief, Dr. Misra and/or PGD did become aware, or should have become aware, of the '078 Patent.

136. Upon information and belief, if Ila Technologies did not have actual knowledge of the '189 Patent, Ila Technologies' lack of knowledge of the '189 Patent was willful. Upon information and belief, Dr. Devi Shankar Misra, Ph.D., is Ila Technologies' Chief Technical Officer<sup>65</sup>; he is also an "inventor of the patented Pure Grown Diamond process" using MPCVD.<sup>66</sup> Upon information and belief, Dr. Misra is a named inventor on at least seven patents relating to diamonds, the earliest of which was not filed until June 2009 (claiming priority to June 2008) (DK3045570T3). Upon information and belief, to have obtained patents, prior art searches of the

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<sup>64</sup> PGD press release, "World's Largest Pure Grown Diamond Unveiled," PR Newswire (Dec. 8, 2014), <https://tiny.cc/0qs7gz>.

<sup>65</sup> <http://2atechnologies.com/history/>

<sup>66</sup> PGD press release, "World's Largest Pure Grown Diamond Unveiled," PR Newswire (Dec. 8, 2014), <https://tiny.cc/0qs7gz>.

technological field were first required. Upon information and belief, Dr. Misra and/or Ila Technologies did become aware, or should have become aware, of the '189 Patent.

137. Upon information and belief, Each Defendant is aware that the normal and customary use of Defendants' infringing CVD diamond products by Defendants' customers and retailers would infringe the '189 Patent.

138. Each Defendant's inducement is ongoing.

**Willful Infringement**

139. Upon information and belief, each of PGD and Ila Technologies has knowledge of the '189 Patent and knowledge that its CVD diamonds and annealed diamonds infringe at least one claim of the '189 Patent. Notwithstanding their knowledge (or willful blindness thereto), each of PGD and Ila Technologies has continued to make, have made, use, offer for sale, sell, and import their infringing CVD and annealed diamonds in the United States.

140. Each Defendant has willfully infringed, and continues to willfully infringe, claims of the '189 Patent.

141. As a direct and proximate cause of the direct, induced and willful infringement by Defendants, Plaintiffs have been and will continue to be irreparably harmed in their business and property rights unless Defendants are enjoined from their infringing activity in the United States.

**DEMAND FOR JURY TRIAL**

Plaintiffs hereby demand a jury for all issues so triable.

**PRAYER FOR RELIEF**

WHEREFORE, Plaintiffs pray for relief against Defendants as follows:

a. Entry of judgment declaring PGD and/or Ila Technologies have directly and/or indirectly infringed one or more claims of the '078 Patent;

b. Entry of judgment declaring PGD's and/or Ila Technologies' infringement of the '078 Patent to be willful;

c. Entry of judgment declaring PGD and/or Ila Technologies have directly and/or indirectly infringed one or more claims of the '189 Patent;

d. Entry of judgment declaring PGD's and/or Ila Technologies' infringement of the '189 Patent to be willful;

e. Entry of an order pursuant to 35 U.S.C. § 283 permanently enjoining Defendants, their officers, agents, servants, employees, attorneys, instrumentalities, and those persons in privity, active concert, or participation with them, from further acts of direct and/or indirect infringement of the '078 and '189 Patents including the manufacture, use, sale, offer for sale, and importation of the infringing products;

f. A full accounting for and an award of damages to Plaintiffs for Defendants' infringement of the '078 and '189 Patents, but in no event less than a reasonable royalty, including enhanced damages pursuant to 35 U.S.C. § 284 in an amount no less than treble damages, together with pre- and post-judgment interest;

g. Entry of judgment declaring that this case is exceptional and awarding Plaintiffs their costs and reasonable attorney fees under 35 U.S.C. § 285; and

h. Such other and further relief as the Court deems just and proper.

Dated: January 9, 2020

Respectfully submitted,

**PERKINS COIE LLP**

/s/ Matthew J. Moffa

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